

The set of IF–THEN rules for the selection of grasp type and aperture size

| IF | | | | | THEN |
|---|-----|------------------------|-----|-----------------------|----------------|
| $L \leq T_{LARGE}$ | AND | $S \leq T_{VERYSMALL}$ | | | 2-digit |
| $L \leq T_{LARGE}$ | AND | $S > T_{VERYSMALL}$ | AND | $S \leq T_{SMALL}$ | 3-digit small |
| $L \leq T_{LARGE}$ | AND | $S > T_{SMALL}$ | | | 3-digit medium |
| $L > T_{LARGE}$ | AND | $S \leq T_{EXTRATHIN}$ | | | lateral small |
| $L > T_{LARGE}$ | AND | $S > T_{EXTRATHIN}$ | AND | $S \leq T_{VERYTHIN}$ | lateral medium |
| $L > T_{LARGE}$ | AND | $S > T_{VERYTHIN}$ | AND | $S \leq T_{THIN}$ | lateral large |
| $L > T_{LARGE}$ | AND | $S > T_{THIN}$ | AND | $S \leq T_{WIDE}$ | palmar small |
| $L > T_{LARGE}$ | AND | $S > T_{WIDE}$ | AND | $S \leq T_{VERYWIDE}$ | palmar medium |
| $L > T_{LARGE}$ | AND | $S > T_{VERYWIDE}$ | | | palmar large |
| <p>The numerical thresholds for the rules were adopted as follows:</p> $T_{LARGE} = 90\% \text{ PW}; \quad T_{WIDE} = 50\% \text{ MPA}; \quad T_{VERYWIDE} = 65\% \text{ MPA};$ $T_{THIN} = 70\% \text{ MLA}; \quad T_{VERYTHIN} = 40\% \text{ MLA}; \quad T_{EXTRATHIN} = 30\% \text{ MLA};$ $T_{SMALL} = 30\% \text{ MPA}; \quad T_{VERYSMALL} = 15\% \text{ MPA};$ | | | | | |
| <p>The notations are: L, S – long and short object axes; MPA – maximal palmar aperture (measured as the distance from the tip of the thumb to the tip of the index finger; the hand was preshaped for the palmar grasp with the fingers maximally extended); MLA – maximal lateral aperture (measured as the distance from the tip of the thumb to the radial side of the index finger; the hand was preshaped for the lateral grasp with the thumb maximally extended); PW – palm width (measured as the distance from the radial aspect of the metacarpophalangeal joint of the index finger to the ulnar aspect of the metacarpophalangeal joint of the little finger).</p> | | | | | |